

### **Remarks**

Claims 16-29 are currently pending in this application. Claims 16, 20, 27 and 29 have been amended, and Claim 17 has been canceled. No new matter has been added as the amendments have support in the specification as originally filed.

### **Interview**

Applicant gratefully acknowledges the telephonic interview with the Examiner conducted on November 7, 2011. Applicant has attempted to address the issues raised by the Examiner in the interview with this response. The Examiner's comments and explanations were helpful and very much appreciated. Pursuant to MPEP § 713.04, Applicant provides the following remarks.

During the interview, Applicant discussed with the Examiner the rejection of Claim 20 under 35 U.S.C. § 112, and suggested inserting a Markush expression in the claim to render it more definite. The Examiner commented that such amendment would be sufficient to overcome the rejection. In response to the rejection under 35 U.S.C. § 103, Applicant pointed out that the terms "a first lithium metal composite oxide" and "a second lithium metal composite oxide" recited in Claims 16, 27 and 29 should be distinguished from the terms "primary particles" and "secondary particles," respectively as disclosed in US 2003/0170540 ("Ohzuku"). The Examiner suggested incorporating the features recited in Claim 17 to Claim 16 to avoid any confusion that may arise. More details as to the substance of the interview will be discussed in the following Remarks.

### **Claim Rejections Under 35 U.S.C. § 112, second paragraph**

The Examiner has rejected Claim 20 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which is regarded as the invention. The Applicant has amended Claim 20 to specifically recite that "the composite cathode active material comprises at least two selected from the group consisting of nickel having an oxidation value of 2.0,

manganese having an oxidation value of 4.0, and cobalt having an oxidation value of 3.0.” Applicant respectfully submits that Claim 20, as amended, complies with the requirements of 35 U.S.C. § 112, second paragraph, and respectfully requests that the rejection be withdrawn.

**Claim Rejections Under 35 U.S.C. § 103**

The Examiner has rejected Claims 16, 17, 19, 20, 22, 26, 27 under 35 U.S.C. § 103(a) as being unpatentable over US 2003/0170540 (“Ohzuku”) in view of U.S. Patent No. 4,594,228 (“Lambert, Jr.”). Specifically, the Examiner has indicated that Ohzuku teaches a process for preparing a positive electrode active material for a lithium secondary battery of a lithium-containing oxide having a general formula, such as  $\text{Li}[\text{Li}_x(\text{A}_y\text{B}_{1-y})_{1-x}]\text{O}_2$  (where A and B are different transition metal elements (e.g., Fe, Ni, Mn and Co),  $0 \leq x \leq 0.3$  and  $0 < y < 1$ ) and  $\text{Li}[\text{Li}_x(\text{A}_y\text{B}_y\text{C}_p)_{1-x}]\text{O}_2$  (where A and B are as described above, C is at least one kind of an added element different from A and B (e.g., Al, Mn, Ca, Sr, Yt, Yb, Fe, Ni, Mn and Co),  $0 \leq x \leq 0.3$  and  $0 < 2y+p < 1$ ), and includes a oxide like a  $\text{LiCo}_{1/2}\text{Ni}_{1/2}\text{O}_2$  and  $\text{LiNi}_{1/3}\text{Mn}_{1/3}\text{Co}_{1/3}\text{O}_2$ . The Examiner further indicated that the positive electrode active material is composed of a mixture of crystalline particles of the lithium-containing oxide having a particle size of 0.1-2  $\mu\text{m}$  and a secondary particle of the lithium-containing oxide having a particle size of 2-20  $\mu\text{m}$ , more likely 10-20  $\mu\text{m}$ . Thus, the Examiner has concluded that Ohzuku teaches the first lithium composite oxide having a mean particle diameter less than 90% than that of the second lithium metal composite oxide.

Claims 1, 27 and 29, as amended, recite, in part:

[...] the first lithium metal composite oxide has a mean particle diameter that is less than 90% of a mean particle diameter of the second lithium metal composite oxide;

the first and second lithium metal composite oxides comprise a primary particle having a particle diameter distribution between about 0.1

µm and about 0.2 µm, and a secondary particle having a mean particle diameter distribution between about 1 µm and about 20 µm when the primary particles are aggregated to form the secondary particles [...]

For at least the reasons discussed below, the asserted combination fails to disclose to suggest the first lithium metal composite oxide has a mean particle diameter that is less than 90% of a mean particle diameter of the second lithium metal composite oxide, as recited in Claim 1.

The outstanding Office Action on page 4, indicates that, as to the first lithium composite oxide having a mean particle diameter less than 90% than that of the second lithium metal composite oxide, Ohzuku teaches that the positive active material is composed of a mixture of crystalline particles of the lithium-containing oxide having a particle size of 0.1-2 µm and a secondary particle of the lithium-containing oxide having a particle size of 2-20 µm, more likely 10-20 µm, as discussed above.

It is respectfully submitted that, however, a first lithium composite oxide and a second lithium metal composite oxide should be distinguished from a primary particle and a secondary particle, respectively. The Applicant's originally-filed application discloses that "[...] given the larger mean diameter lithium composite oxide is designated A and the smaller mean diameter lithium composite oxide is designated B, a difference between a mean particle diameter of A and B is preferably more than 10% of the mean particle diameter of A [...] the mean particle diameter of lithium composite oxide B refers to an average value of particle diameter of the primary particles when the lithium oxide is composed of the primary particles, or an average value of particle diameter of the secondary particles when the primary particles are aggregated to form the secondary particles provided that lithium composite oxide B is preferably in form of which the primary particles are aggregated to form secondary particles(paragraph [0037])." Thus, the present invention discloses that the **secondary** mean particle diameter of the **first** lithium composite oxide is less than 90% than the **secondary** mean particle diameter of the **second** lithium composite oxide, provided that the second lithium composite oxide is in form of which the primary particles are aggregated to form

secondary particles (emphasis added). In other words, the feature recited in Claims 16, 27 and 29 makes a comparison between the **primary** mean particle diameter of the first lithium composite oxide and the **primary** mean particle diameter of the second lithium composite oxide, or alternatively, between the **secondary** mean particle diameter of the first lithium composite oxide and the **secondary** mean particle diameter of the second lithium composite oxide (emphasis added).

Accordingly, although Ohzuku may teach crystalline particles of the lithium-containing oxide having a particle size of 0.1-2  $\mu\text{m}$  being less than 90% of the a secondary particle of the lithium-containing oxide having a particle size of 2-20  $\mu\text{m}$ , this is a comparison of size of a primary particle to that of a secondary particle (Emphasis added). As such, for at least the reasons discussed above, the asserted combination fails to disclose, suggest, or render obvious the subject matter recited in Claims 16, 27, and 29 in which the first lithium composite oxide has a mean particle diameter less than 90% than that of the second lithium metal composite oxide.

Further, the Examiner has indicated in the Office Action on page 3 that Ohzuku teaches  $\text{LiNi}_{1/3}\text{Mn}_{1/3}\text{Co}_{1/3}\text{O}_2$  as a lithium metal composite oxide which may read upon  $\text{Li}_{1+\delta}[\text{Ni}_x\text{Mn}_{x+y}\text{Co}_{1-2(x+y)}\text{M}_y]\text{O}_{2-a}\text{P}_a$  as recited in Claim 27. Independent Claim 27 recites a method for preparing a composite cathode active material for a lithium secondary battery by producing a first lithium metal composite oxide, producing a second lithium metal composite oxide, and mixing the first and second lithium metal composite oxides. Claim 27 defines the first and second lithium metal composite oxides as follows:

| Lithium Metal Composite Oxide   | Chemical Formula  |
|---|---|
| first   | $\text{LiNi}_{1-x-y}\text{Co}_x\text{M}'_y\text{O}_2\text{P}_z$   |
| second  | selected from the group consisting of:<br>$\text{Li}_{1+\delta}[\text{Ni}_x\text{Mn}_{x-y/2}\text{Co}_{1-2x-z}\text{M}_y\text{N}_z]\text{O}_{2-a}\text{P}_a$<br>and<br>$\text{Li}_{1+\delta}[\text{Ni}_x\text{Mn}_{x+y}\text{Co}_{1-2(x+y)}\text{M}_y]\text{O}_{2-a}\text{P}_a$ |
| The parameters M, M', N, P, $\delta$ , x, x', y, z and a are defined in Claim 27. |   |

However, the Examiner has not pointed to any disclosure in Ohzuku that can be read upon  $\text{LiNi}_{1-x-y}\text{Co}_x\text{M}'_y\text{O}_2\text{P}_z$ , which is recited as the formula for the first lithium metal composite oxide in Claim 27(Emphasis added). As such, Claim 27 recites a combination of features which is not disclosed by Ohzuku. The Examiner has provided no rationale as to why it would be obvious to modify the Ohzuku method to obtain the invention recited in Claim 27. The Applicant therefore respectfully submits that Claim 27 is allowable over the teachings of Ohzuku, and respectfully requests that this rejection be withdrawn.

Based on the foregoing, it is respectfully submitted that the references do not teach or suggest the features of amended Claims 16, 27 and 29. Accordingly, it is respectfully asserted that independent Claims 16, 27 and 29, and its respective dependent Claims are allowable over the cited references.

#### **No Disclaimers or Disavowals**

Although this communication may include amendments to the application, and may characterize the claim scope and/or referenced art, the Applicant does not concede that previously pending claims are not patentable over the cited references. Rather, any amendments and/or characterizations are being made to facilitate expeditious prosecution of this application. The Applicant reserves the right to later pursue any previously pending or other broader or narrower claims that capture any subject matter supported by the present disclosure, including subject matter found to be specifically disclaimed herein or by any prior prosecution. Accordingly, reviewers of this or any parent, child or related prosecution history cannot reasonably infer that the Applicant has made any disclaimers or disavowals of any subject matter supported by the present disclosure.

#### **Conclusion**

In view of the foregoing, this application is believed to be in condition for allowance, and such allowance is respectfully requested. Should the Examiner believe that a telephone conference or personal interview would facilitate resolution of any

Application Number **10/580,890**  
Amendment Filed **21 November 2011**  
Reply to Office Action of **19 July 2011**

Attorney Docket **LPP20081318US**

remaining matters, the Examiner may contact the Applicant's attorney at the number given below. The Commissioner is authorized (a) to charge LEXYOUME's Deposit Account No. 504054 for any fees required under 37 C.F.R. §§ 1.16 and 1.17 that are not covered, in whole or in part, by a credit card payment form submitted herewith, and (b) to credit any overpayment to said Deposit Account No. 504054.

Respectfully submitted,

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